MAMATOV, M.

Local theorem for lattice random variables. Izv.AN Uz.SSR.Ser. fiz.-mat.nauk 6 no.1:82-84 '62. (MIRA 15:4)

1. Tashkentskiy gosudarstvennyy universitet imeni Lenina.
(Lattice theory)

MAMATOV, A.D.; KABRIN, L.A.; MAYGOV, I.V.

For the lengthening of the service life of coke oven batteries.
Koks i khim. no.12:27-29 '63. (MIRA 17:1)

1. Kemerovskiy koksokhimicheskiy zavod.

AUTHOR: Mamatov, A.D. SOV/68-59-6-13/25

TITLE: Experience in a Prolonged Operation of a Coke Oven Battery Without Capital Repairs (Opyt dlitel'noy raboty koksovoy batarei bez kapital'nogo remonta)

PERIODICAL: Koks i Khimiya, 1959, Nr 6, pp 52-54 (USSR)

ABSTRACT: Operating conditions of a coke oven battery (which started operating in 1939 and is still in operation without capital repairs of ovens) and the repairs which secured its long service life are described. There are 2 figures and 1 table.

Card 1/1

ASSOCIATION: Kemerovskiy koksokhimicheskiy zavod (Kemerovo Coking Works)

AUTHORS: Mamatov, A.D. and Ayzikov, P.S. 68-58-2-6/21

TITLE: A New Method of Measuring the Temperature Along the Axis of Coke in an Oven (Novyy metod izmereniya temperatur po osi koksovogo piroga)

PERIODICAL: Koks i Khimiya, 1958, Nr 2, pp 36 - 37 (USSR)

ABSTRACT: As the durability of thermocouples used for measuring temperatures in the tar-line plane is low and, in particular, of those reaching deep into the charge, these were replaced by tunes with conical bottoms (Fig.1) and the temperatures are read with an optical pyrometer. The tubes are placed into position through special holes in the lids of charging holes 7 - 8 hours after the beginning of coking (Fig.2) and removed when the required temperature is reached. A good agreement between the temperatures measured by this method and with thermocouples (± 10 - 30 °C) is claimed (table). There are 2 figures and 1 table.

ASSOCIATION: Kemerovskiy koksokhimicheskiy zavod (Kemerovo Coke Oven Works)

AVAILABLE: Library of Congress

Card 1/1

1. Coke - Preparation - Equipment 2. Coke ovens - Temperature - Measurement 3. Optical pyrometers - Applications

MAMATOV, A.D.

AUTHOR: Zlatin, L.E., and Mamatov, A.D. (Kemerovsk Coke Oven Works).

TITLE: From the experience of changing reinforcing frames. 141
(Opyt zameny armiruyushchikh ram.)

PERIODICAL: "Koks i Khimiya", (Coke and Chemistry),
1957, No. 2, pp. 33 - 35, (U.S.S.R.)

ABSTRACT: The procedure developed for replacing coke oven reinforcing frames from the pusher and the coke side is given in some detail.
There are four illustrations.

MAMATKULOV, U.K.

Lydiaea vlassovi (Lazar.) Lazar. in the flora of Tajikistan. Dokl. AN Tadzh.SSR 8 no.9:30-31 '65.

(MIRA 18:12)

1. Botanicheskiy institut AN Tadzhikskoy SSR. Submitted April 17, 1965.

L 05637-67

ACC NR: AP6023029

acteristic of a structure with a thin base, the author shows that this characteristic kink is connected with the increase of the voltage drop in the i-layer with increasing rectifier current. An expression is derived for the volt-ampere characteristic, which is shown to be approximated by different expressions in the low-current range, in the range where the recombination terms is the strongly doped regions has a noticeable influence, and the range where the recombination current prevails over the recombination current of the central region. It is also shown that the expressions obtained for the volt-ampere characteristic by R. H. Hall (Proceedings IRE, v. 40, 1952, p. 1512) are valid only at low currents, and that additional terms must be introduced at higher currents. Addition of these terms brings the theoretical volt-ampere characteristic closer to the experimental values. Orig. art. has: 2 figures and 14 formulas.

SUB CODE: 20, 09/ SUBM DATE: 25Dec64/ ORIG REF: 006/ OTH REF: 005

Card 2/2

L 05637-67

ACC NR: AP6023029 SOURCE CODE: UR/0166/66/000/002/0051/0057

AUTHOR: Mamatkulov, R.

ORG: Tashkent State University im. V. I. Lenin (Tashkentskiy gosuniversitet)

TITLE: Influence of the modulation of resistance of a high resistance base region on the volt-ampere characteristic of sandwich structures with one pn junction

SOURCE: AN UzSSR. Izv. fiz-matem n, no. 2, 1966, 51-57

TOPIC TAGS: pn junction, semiconductor rectifier, electric resistance, volt ampere characteristic, semiconductor carrier, minority carrier, electron recombination

ABSTRACT: This is a continuation of earlier work by the author (Izv. AN UzSSR, ser. fiz-mat nauk no. 4, 6, 1962; no. 2, 3, 1963), dealing with rectifiers having a p-i-n structure. An expression is derived for the total current through the junction under the assumption that the carriers have a Boltzmann distribution in the i-n and p-i junctions, and with allowance for the fact that the minority carrier density at any point of the rectifier depends on the current strength, and consequently on the applied external voltage. The expression shows that the total current is the sum of the recombination current of the minority carriers in the central i region, and the current due to transition of the minority carriers through the two junctions (the recombination current). To explain the experimentally observed deviation of the volt-ampere characteristics of high-power p-i-n structures from exponential, and particularly to explain the appearance of the characteristic kink on the volt-ampere char-

Card 1/2

MAMATKULOV, R.

Volt-ampere characteristics of a rectifier of p^+ -- p -- n^+ structure in a forward direction at a high injection level. Nauch. trudy TashGu no.221.Fiz. nauki no.21:184-196 '63.

Volt-ampere characteristics of a rectifier of p^+ -- p -- n^+ structure in a forward direction at a low injection level. Ibid.:197-201

(MIRA 17:4)

MAMATKULOV, R.

Calculation of the volt-ampere characteristics of a forward biased $p^+ - n - n^+$ diode at a high level of injection. Izv. AN Uz. SSR. Ser. fiz.-mat. nauk 7 no.2:86-92 '63. (MIRA 16:6)

1. Tashkentskiy gosudarstvennyy universitet imeni Lenina.
(Transistors)

Calculation of the volt-ampere ...

conduction type region, and L_i is the corresponding carrier diffusion length. In the i-type conduction region the potential drops most sharply with $d/L_i \gg 1$.

ASSOCIATION: Tashkentskiy gosuniversitet im. V. I. Lenina (Tashkent State University imeni V. I. Lenin)

SUBMITTED: June 15, 1962

Card 3/3

Calculation of the volt-ampere ...

$$j \simeq \frac{2bqD_p p_{i0}}{\left(b \cdot \mathrm{ch}\frac{d}{L_i} + 1\right) L_i} \cdot \mathrm{sh}\frac{d}{L_i}\left(e^{\frac{qV_{pi}}{kT}} - 1\right) +$$

$$+ \frac{(b+1)qD_n n_{p0}}{\left(b \cdot \mathrm{ch}\frac{d}{L_i} + 1\right) L_{np}} \cdot C_2\left(e^{\frac{2qV_{pi}}{kT}} - \mathrm{ch}\frac{d}{L_i}\right) + \quad (7).$$

$$+ \frac{(b+1)qD_p p_{n0}}{\left(b \cdot \mathrm{ch}\frac{d}{L_i} + 1\right) L_{pn}} \cdot C_1\left(e^{\frac{2qV_{pi}}{kT}} \cdot \mathrm{ch}\frac{d}{L_i} - 1\right).$$

Here S_p and S_n are the hole and electron surface recombination rates; the other symbols are taken from previous studies. (7) is discussed for two cases: 1) The potential drop in the p-, i- and n-type conduction regions is negligible. 2) The potential drop in the p- and n-type conduction regions is not negligible. Results: The density of the saturation current of the diode depends on S_p, S_n and d/L_i, where d is the thickness of the

Card 2/3

24778

S/166/62/000/006/014/016
B104/B186

AUTHOR: Mamatkulov, R.

TITLE: Calculation of the volt-ampere characteristic of a symmetric diode in forward direction allowing for the finiteness of the surface recombination rate at the contacting points

PERIODICAL: Akademiya nauk Uzbekskoy SSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, no. 6, 1962, 106 - 110

TEXT: The volt-ampere characteristic of a p-i-n diode is calculated in the forward direction for an arbitrary majority carrier recombination surface rate at the contacting points between semiconductor and metal, based largely on previous publications (R. Mamatkulov, Izv. AN UzSSR, seriya fiz.-mat. nauk, 1962, no. 4 and no. 6):

Card 1/3

the range occupied by the space charge of the p-i junction; $P_{io} = n_{oi} = n_i$ is the equilibrium concentration of the minority carriers, n_{po} and p_{no} are the electron and hole concentrations in the p- and n- type conduction regions, and d_1', d' are the thicknesses of the p- and n-type conduction regions. (3) is discussed for three cases: 1) The applied potential drops mainly at the p-i and i-n junctions; 2) the potential drops only slightly along the thickness of the high-alloyed p- and n-type conduction regions. 3) the potential drops in the p- and n-type conduction regions.

ASSOCIATION: Tashkentskiy gosuniversitet im. V. I. Lenina (Tashkent State University imeni V. I. Lenin)

SUBMITTED: June 15, 1962

$$I \simeq \frac{2bqD_p p_{i0}}{\left(b \cdot \mathrm{ch}\frac{d}{L_i}+1\right)L_i} \cdot \mathrm{sh}\frac{d}{L_i}\left(e^{\frac{qV_{pi}}{kT}}-1\right)+$$

$$+\frac{(b+1)qD_n n_{p0}}{\left(b \cdot \mathrm{ch}\frac{d}{L_i}+1\right)L_{np}} \cdot \mathrm{cth}\frac{d_1'}{L_{np}}\left(e^{\frac{2qV_{pi}}{kT}}-\mathrm{ch}\frac{d}{L_i}\right)+ \qquad (3)$$

$$+\frac{(b+1)qD_p p_{n0}}{\left(b \cdot \mathrm{ch}\frac{d}{L_i}+1\right)L_{pn}} \cdot \mathrm{cth}\frac{d'}{L_{pn}}\left(e^{\frac{2qV_{pi}}{kT}} \cdot \mathrm{ch}\frac{d}{L_i}-1\right).$$

is obtained for the current density using equations, figures, and symbols from previous publications (A. Herlet, E. Spenke, Zs. angew. Phys., 7, 99, 149, 195, 1955; Ye. Ye. Pikus, Poluprovodniki v nauke i tekhnike- Semiconductors in science and engineering, v. I., Izd. vo AN SSSR, 1957; R. Mamatkulov, Izv. AN UzSSR, 1962, no. 4). V_{pi} is the potential drop within

24.7700

S/166/62/000/006/013/016
B104/B186

AUTHOR: Mamatkulov, R.

TITLE: A theoretical study of the volt-ampere characteristic of a symmetric p-i-n diode in forward direction

PERIODICAL: Akademiya nauk Uzbekskoy SSR. Izvestiya. Seriya.fiziko-matematicheskikh nauk, no. 6, 1962, 101 - 105

TEXT: The volt-ampere characteristic of a symmetric p-i-n diode is studied theoretically for arbitrary d/L_i ratios allowing for the potential drop along the thickness of moderately and high-alloyed p- and n-regions. d is the thickness, i indicates the conduction-type region and L_i is the carrier diffusion length.

Card 1/3

S/166/62/000/004/010/010
Calculation of the I-V characteristics ... B112/B186

ASSOCIATION: Tashkentskiy gosuniversitet im. V. I. Lenina
(Tashkent State University imeni V. I. Lenin)

SUBMITTED: April 12, 1962

/c

Card 4/4

For the I-V characteristics the solution is

$$j = \frac{2bkT\mu_p p_{l0}}{(b+1)L_l} \operatorname{sh}\frac{d}{L_l}\left(e^{\frac{q(V-V_{rl})}{2kT}} - 1\right) + \qquad (2,13)$$

$$+\left(\frac{kT\mu_n n_{p0}}{L_{np}} \operatorname{cth}\frac{d_1'}{L_{np}} + \frac{kT\mu_p p_{n0}}{L_{pn}} \operatorname{cth}\frac{d'}{L_{pn}}\right)\left(e^{\frac{q(V-V_{rl})}{kT}} - 1\right).$$

These expressions contain formulas by G. Ye. Pikus (Poluprovodniki v nauke i tekhnike - Semiconductors in Science and Engineering, v. 1, M, AN SSSR, 1957), A. Herlet, E. Spenke (Zs. angew., 7, 99, 149, 195, 1955) and W. Schockley (Bell. syst. Techn. j., v. 28, 3, 435, 1949). Final expression for the I-V characteristics of a p-i-n diode working in forward direction by taking into account the voltage drop in the thickness of p, i-, and n regions. There is 1 figure.

$$\partial n_r/\partial t = \frac{1}{q}\frac{dj_{nr}}{dx} - (n_r - nr_o)/\tau_{nr} = 0 \qquad (1,5)$$

$$p_p(x) = n_p(x) + N_a \quad \text{(in the p-region)} \qquad (1,6)$$

$$p_i(x) = n_i(x) \quad \text{(in the i-region)} \qquad (1,7)$$

$$n_n(x) = p_n(x) + N_\partial \quad \text{(in the n-region)} \qquad (1,8)$$

At the point x = 0, the amperage is

$$j = \frac{2bkT\mu_p p_{i0}}{(b+1)L_i}\,\mathrm{sh}\,\frac{d}{L_i}\left(e^{\frac{qV_{pi}}{kT}}-1\right) + \qquad (1,29)$$

$$+\left(\frac{kT\mu_n n_{p0}}{L_{np}}\,\mathrm{cth}\,\frac{d_1}{L_{np}} + \frac{kT\mu_p p_{n0}}{L_{pn}}\,\mathrm{cth}\,\frac{d}{L_{pn}}\right)\left(e^{\frac{2qV_{pi}}{kT}}-1\right).$$

S/166/62/000/004/010/010
B112/B186

24.7700

AUTHOR: Mamatkulov, R.

TITLE: Calculation of the I-V characteristics of a symmetrical p-i-n diode in the forward direction

PERIODICAL: Akademiya nauk Uzbekskoy SSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, no. 4, 1962, 92-99

TEXT: The author considers a symmetrical p-i-n diode whose stationary currents are described by the equations

$$j_{pr}(x) = q\mu_p p_r(x) E_r(x) - qD_p \frac{dp_r}{dx}, \quad (1,1)$$

$$j_{nr}(x) = q\mu_n n_r(x) E_r(x) + qD_n \frac{dn_r}{dx}, \quad (1,2)$$

$$j = j_p(x) + j_{nr}(x), \quad (1,3)$$

$$\frac{\partial p_r}{\partial t} = -\frac{1}{q}\frac{dj_{pr}}{dx} - \frac{p_r - p_{r0}}{\tau_{pr}} = 0, \quad (1,4)$$

Card 1/4

MAMATKULOV, R.

GURVICH, L.G.; MAMATKULOV, R.; KHUDAYBERGENOVA, Z.

Tables for conversion of scattering angles and differential scattering cross sections used in the transition from the inertia center system to the observer's system. Trudy FTI AN Uz. SSR 6:62-71 '55. (MLRA 9:12)

(Particles, Elementary--Scattering)

MAMATKULOV, M. M.

Cand Geol-Min Sci - (diss) "Several problems of the history of the formation of terrain and quaternary deposits of the Sandalash River Basin (Western T'ien-Shan)." Tashkent, 1961. 27 pp; (Academy of Sciences Uzbek SSR, Inst of Hydrogeology and Engineering Geology); 250 copies; price not given; (KL, 7-61 sup, 225)

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001032000027-6

MAMATKULOV, M.M.

History of relief formation of the Sandalash Basin. Uzb. geol. zhur. no.5:63-72 '60. (MIRA 13:11)

1. Institut geologii AN UzSSSR
(Sandalash Valley--Geology, Structural)

MAMATKULOV, M.M.

Geomorphological divisions of the Sandalash Basin (Chatkal River).
Uzb.geol.zhur. no.1:62-68 '60. (MIRA 13:6)

1. Institut geologii AN UzSSR.
(Sandalash Valley--Physical geography)

MAMATKULOV, M.M.

On the number of ancient glaciations in the Sandalash basin (Chatkal River). Dokl.AN Uz.SSR no.11:21-24 '59.
(MIRA 13:4)

1. Institut geologii AN UzSSR. Predstavleno chlenom-korr. AN UzSSR G.A.Mavlyanovym.
(Chatkal Valley--Glaciers)

MAMATKULOV, M.M.

Sandalash glaciers in the Chatkal Basin. Uzb. geol. zhur. no.4:73-79 '59. (MIRA 13:1)

1. Institut geologii AN UzSSR.
(Sandalash Valley--Glaciers)

CHERNOMORDIKOV, V. V.; Prinimali uchastiye: GORYACHEVA, M., student-diplomnik; TOKAREVA, T., student-diplomnik; CHERNYSHEVA, Ye., student-diplomnik; SHUTOVA, M., student-diplomnik; MAMATKINA, E., studentka

Thermophily and hygrophily of Norway and black rats. Nauch. dokl. vys. shkoly; biol. nauki no.3:69-72 '62. (MIRA 15:7)

1. Kafedra zoologii pozvonochnykh Moskovskogo gosudarstvennogo universiteta im. M. V. Lomonosova (for Goryacheva, Tokareva, Chernysheva, Shutova). 2. Moskovskiy zaochnyy sel'skokhozyaystvennyy institut (for Mamatkina).

(RATS) (ZOOLOGY--ECOLOGY)

CHERNOMORDIKOV, V.V.; Prinimali uchastiye: BESPALOVA, I.; NAD"YARNAYA, N.; TOKOREVA, T.; MAYATYINA, E.

Atmospheric humidity as an ecologico-physiological factor. Dokl. AN SSSR 140 no.4:935-937 O '61. (MIRA 14:9)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova. Predstavleno akademikom I.I.Shmal'gauzenom.

(HUMIDITY--PHYSIOLOGICAL EFFECT)

MAMATKIN, [redacted]; VOLKOV, V.A., retsenzent; PUSHKIN, P.S., retsenzent; KVYATKEVICH, I.K., retsenzent; MASLOV, I.G., redaktor; DMITRIYEVA, N.I., tekhnicheskiy redaktor.

[Mechanization and assembly-line production of leather goods] Mekhanizatsiia i konveierizatsiia kozhevennogo proizvodstva. Moskva, Gos.nauchno-tekhn.izd-vo M-va legkoi promyshl.SSSR, 1957. 310 p. (MIRA 10:11)

(Leather industry)

1. MAMATKIN, B. A.

2. USSR (600)

4. Leather - Machinery

7. Introducing a conveyer system in wet processing of leather. Leg. prom no. 12 1952

Monthly Lists of Russian Accessions, Library of Congress, March, 1953, Unclassified.

VISHNEVSKIY, A.R.; MAMATKAZIN, L.V.; PASTUKHOV, I.F.

Methods for fatigue testing of [illegible] machine parts. Zav. lab. 31 no. 12:1506-1508 '65 (MIRA 19:1)

MAMATELASHVILI, V.G.

The 30th anniversary of the Georgian Zootechnical and Veterinary Training and Research Institute. Veterinariia 39 no.12:18-21 D '62. (MIRA 16:6)

1. Rektor Gruzinskogo zootekhnicheesko-veterinarnogo uchebno-issledovatel'skogo instituta.

(Georgia--Veterinary research)

DZHORBENADZE, A.V., prof.; MAMATELASHVILI, V.G., dots.

[Fundamental techniques of pathoanatomical dissection of farm animals] [Osnovy tekhniki patanatomicheskogo vskrytiia sel'skokhoziaistvennykh zhivotnykh. Tbilisi, Gos. izd-vo uchebno-pedagog.lit-ry "TSodna"] 1962. 290 p. [In Georgian]
(MIRA 17:5)

USSR/Farm Animals. Cattle. Q

Abs Jour: Ref Zhur-Biol., No 4, 1958, 16805.

Author : Mamatelashvili V.G., Moroshkin B.F.
Inst :
Title : On the Patho-Morphological Changes of the Urinary System in Cattle Fed by Arboreal Vegetation (K voprosu o pato-morfologicheskikh izmeneniyakh mochevoy sistemy u krupnogo rogatogo skota pri kormlenii ego drevesnoy rastitel'nost'yu)

Orig Pub: Tr. Gruz. n.-i. vet. in-ta, 1955, 11, 161-178.

Abstract: No abstract.

Card : 1/1

MAMATELASHVILI, V.G.

Mamatelashvili, V.G. - "A study of pathomorphological changes in contagious agalactia of sheep in Georgia", Sbornik trudov (Gruz. zooteknin.-vet. in-t), Vol. VI, 1953, p. 27-40, (In Georgian, resume in Russian), - Bibliog: p. 40.

SO: U-4110, 17 July 53, (Letopis 'Zhurnal 'nykh Statey, No. 19, 1949).

MAMASHEV, S.

Algebraic extendability of the solution to one nonlinear operator equation in a Banach space. Izv. AN Uz. SSR. Ser. fiz.-mat. nauk 9 no.1:28-33 '65. (MIRA 18:6)

1. Samarkandskiy gosudarstvennyy universitet.

L 06500-67 EWT(m) JXT(CZ)
ACC NR: AP7000459 SOURCE CODE: UR/0367/66/004/001/0052/0056

DZHIBUTI, R. I.; MAMASAKHLISOV, V. I.; MACHARADZE, T. S.

"Identification of Energy Level in Light Nuclei According to Disintegration Cross-Sections"

Moscow, Yadernaya Fizika; July, 1966; pp 52-56

ABSTRACT: The photonuclear reaction $Li^7(\gamma, H^3)He^4$ is investigated taking the interaction of the final state products into account. It is shown that the large value of the Li^7 photo-disintegration cross-section in the region before and after the maximum on the cross-section curve, corresponding to the 4.63 MeV state, is due to direct transitions into the continuous spectrum. Orig. art. has: 2 figures and 12 formulas. [Based on authors' Eng. abst.] [JPRS: 37,330]

ORG: Institute of Physics, AN GruzSSR (Institut fiziki AN GruzSSR)

TOPIC TAGS: photonuclear reaction, light nucleus

SUB CODE: 20 / SUBM DATE: 09Nov65 / ORIG REF: 003 / OTH REF: 012

Card 1/1 mlc 0923 1163

L 27971-66 EWT(m)

ACC NR: AP6017676 SOURCE CODE: UR/0251/65/040/003/0567/0572

AUTHOR: Mamasakhlisov, V. I. (Academician AN GruzSSR); Dzhibuti, R. I.; Macharadze, T. S.

ORG: Institute of Physics, AN GruzSSR, Tbilisi (Institut fiziki AN GruzSSR)

TITLE: Photodisintegration of H sup 3 sub e and H sup 3 nuclei

SOURCE: AN GruzSSR. Soobshcheniya, v. 40, no. 3, 1965, 567-572

TOPIC TAGS: photonuclear reaction, matrix element, angular distribution, nucleon

ABSTRACT: The authors indicated in a previous article that, in view of the unusual behavior at small and great distances of the approximate (variational) functions used for the ground state of H^3_e and H^3, an investigation of the photodisintegration of these nuclei ought to be based on the form of the matrix transition element $(\vec{J}\ \vec{A})_{if}$ rather than on the form $(\vec{E}\ \vec{D})_{if}$ ordinarily used. The authors' theory, based on the form $(\vec{J}\ \vec{A})_{if}$, explains the qualitative peculiarities of the photodisintegration of the H^3_e nucleus -- something which the theory of Gunn and Irving fails to do. The present article, which is a continuation of the earlier article, considers the angular distributions of photonucleons from the reactions $H^3_e(\gamma, p)d$ and $H^3_e(\gamma, n)2p$, the contributions of quadrupole terms to the cross-sections of these reactions, the energy distribution of photonucleons in a three-particle break-up (using the photoproton spectrum from the reaction $H^3(\gamma, p)2n$), and the effect on this distribution of the admixture of a mixed symmetry state in the wave function of the nucleus. Orig. art. has: 2 formulas and 1 figure. [JPRS]

SUB CODE: 20 / SUBM DATE: 16Jun65 / ORIG REF: 003 / OTH REF: 006

Card 1/1

L 25758-66

ACC NR: AP6016396

agreement. The authors thank I. Sh. Vashakidze and G. A. Chilashvili and also the participants at the Seminar for Theoretical Physics, Tbilisi State University for the valuable discussions. Orig. art. has: 8 figures and 25 formulas. [JPRS]

SUB CODE: 20 / SUBM DATE: none / ORIG REF: 003 / OTH REF: 011

Card 2/2

L 25758-66 -EWT(m) DIAAP JD

ACC NR: AP6016396

SOURCE CODE: UR/0048/65/029/007/1141/1150

AUTHOR: Dzhibuti, R. I.; Mamasakhlisov, V. I.; Macharadze, T. S.

ORG: Institute of Physics, AN GruzSSR (Institut fiziki AN GruzSSR)

TITLE: Theory of photosplitting of the lightest nuclei

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 29, no. 7, 1965, 1141-1150

TOPIC TAGS: light nucleus, photonuclear reaction, matrix element, helium, hydrogen, approximation, vector, electromagnetic wave

ABSTRACT: This article begins with a brief review of experimental and theoretical works devoted to the study of photosplitting of the lightest nuclei (He^3, H^3, He^4). Conclusions are drawn from these former works that although existing theory of photosplitting of these nuclei is based on the form of the matrix element $(ED)_{if}$, starting with the matrix element $(JA)_{if}$ is more reasonable and would lead to elimination of much of the disagreement between theoretical and experimental results. (E is the electrical vector, D is the dipole moment, J is the current, and A is the vector-potential of the electromagnetic wave.) The work then proceeds with an investigation of the reactions $He^3(\gamma p)d$, $He^3(\gamma n)2p$, $He^4(\gamma p)H^3$, and $He^4(\gamma p)p2n$ from this point of view, the calculations being made by means of the Born approximations. A comparison of the theoretical calculations with experimental results shows good

Card 1/2

L 25759-66 EWA(h)/EWT(m)

ACC NR: AP6016395 SOURCE CODE: UR/0048/65/029/007/1131/1140

AUTHOR: Dzhibuti, R. I.; Mamasakhlisov, V. I.; Macharadze, T. S. 38 B

ORG: Institute of Physics, AN GruzSSR (Institut fiziki AN GruzSSR) 19

TITLE: Photonuclear reactions with the emission of alpha-particles and four-particle correlations in light nuclei

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 29, no. 7, 1965, 1131-1140

TOPIC TAGS: alpha particle, light nucleus, nucleon, carbon, photonuclear reaction

ABSTRACT: This article begins with a brief review of various unsuccessful efforts to describe photodissociation of nuclei leading to the emission of α-particles. The work then proceeds with an investigation of the $(\gamma\alpha)$ reaction on the basis of a nucleon association model, taking into account the Coulomb and nuclear interactions of the products of the reaction. The results of this investigation are then applied to the specific case of the C^{12} $(\gamma\alpha)$ reaction. A comparison of the experimental data for the latter case with the results obtained from theoretical calculation using the proposed method indicates significant improvement over results obtained using other approaches. Orig. art. has: 2 figures and 19 formulas. [JPRS]

SUB CODE: 20 / SUBM DATE: none / ORIG REF: 005 / OTH REF: 014

Card 1/1 CC

L 27743-66

ACC NR: AP6018707

the second 0^+ level lies quite high (20 Mev) above the ground level, it is most probable that the excitation is single-particle and possibly corresponds to formation of a 3 + 1 cluster formation. The closeness of the following levels that are observed in the He^4 nucleus offers evidence in favor of a collective nature for these levels. Orig. art. has: 1 formula.

SUB CODE: 20/ SUBM DATE: 02Apr66/ OTH REF: 003

Card 2/2

L 27143-66 EWT(m)/T

ACC NR: AP6018707 SOURCE CODE: UR/0386/66/003/011/0456/0457

AUTHOR: Dzhibuti, R. I.; Mamasakhlisov, V. I.; Macharadze, T. S.

ORG: Tbilisi State University (Tbilisskiy gosudarstvennyy universitet); Institute of Physics, Academy of Sciences, Georgian SSR (Institut fiziki Akademii nauk Gruzinskoy SSR)

TITLE: Excited states of the He^4 nucleus

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 3, no. 11, 1966, 456-457

TOPIC TAGS: helium, excited state, nuclear energy level, nuclear spin, quantum number, deformed nucleus, excitation energy

ABSTRACT: The authors point out certain circumstances which suggest that the excited levels of He^4, with approximate energies 24 and 30 Mev, the existence of which has been recently proposed (P. E. Argan et al., Suppl. Nuovo Cim. v. 3, 245, 1965), and for which no data on the spin and parity are as yet available, can be regarded as rotational levels. If the likely possibility is assumed that the second ground level of He^4 corresponds to a deformed state belonging to the rotational band, with $E_J = aJ(J + 1)$, then the experimental data yield an excitation energy ratio $E_2 : E_4 : E_6 = 1 : 3.1 : 7.7$, which agrees well with the ratio for the rotational band of an even-even nucleus 1 : 3.3 : 7.7. Without considering the manner in which the initially-spherical helium nucleus becomes deformed, it is pointed out that since

Card 1/2

L 23013-66 EWT(m)/EWA(h)

ACC NR: AP6014824 SOURCE CODE: UR/0367/65/001/006/0976/0983

AUTHOR: Dzhibuti, R. I.; Mamasakhlisov, V. I.; Macharadze, T. S. 37 B

ORG: Institute of Physics, AN GruzSSR (Institut fiziki AN GruzSSR)

TITLE: Photonuclear reactions 19 with alpha-particle 19 emission and four-particle correlations in light nuclei

SOURCE: Yadernaya fizika, v. 1, no. 6, 1965, 976-983

TOPIC TAGS: nuclear shell model, Coulomb interaction, photonuclear reaction, angular distribution, alpha particle

ABSTRACT: The (gamma, alpha) reactions on light nuclei are considered, using the nuclear shell model with four-particle correlations. The influence of the Coulomb and nuclear interaction of reaction products on the total cross section and angular distribution of alpha-particles for E2 + M1-transitions is investigated. The results are compared with the experimental data. Orig. art. has: 2 figures and 9 formulas. [Based on authors' Eng. abst.] [JPRS]

SUB CODE: 20 / SUBM DATE: 31Dec64 / ORIG REF: 006 / OTH REF: 010

2

Card 1/1 pla

DZHIBUTI, R.T.; MAMASAKHLISOV, V.I.; MACHARADZE, T.S.

Photonuclear reactions with α-particle yield and the four-particle correlations in light nuclei. Izv. AN SSSR. Ser. fiz. 29 no.7:1131-1140 Jl '65.

Theory of the photodisintegration of the lightest nuclei. Ibid.:1141-1150 (MIRA 18:7)

1. Institut fiziki AN GruzSSR.

L 4376-66
ACCESSION NR: AP5020254

in good agreement with experiment. 'We thank I. Sh. Vashakidze and G. A. Chilashvili as well as the members of the Theoretical Physics Seminar of the Tbilisi State University for valuable discussions.' Orig. art. has: 3 figures and 3 formulas.

ASSOCIATION: Institut fiziki Akademii nauk Gruzinskoy SSR (Institute of Physics, Academy of Sciences, Georgian SSR)

SUBMITTED: 31Dec64 ENCL: 00 SUB CODE: NP

NR REF SOV: 004 OTHER: 011

Card 2/2

L 4376-66 EWT(m) DIAAP
ACCESSION NR: AP5020254 UR/0367/65/002/001/0059/0063

AUTHORS: Dzhibuti, R. I.; Mamasakhlisov, V. I.; Macharadze, T. S. 44

TITLE: On the theory of photodisintegration of the lightest nuclei 14

SOURCE: Yadernaya fizika, v. 2, no. 1, 1965, 59-63

TOPIC TAGS: photoeffect, helium, nuclear reaction, nuclear cross section

ABSTRACT: Cross sections for the total and two-body photodisintegration of He^3 and He^4 are calculated in the Born approximation on the basis of the matrix element $(JA)_{if}$ (J -- current, A -- vector potential of the electromagnetic wave). The results are compared with cross sections calculated using the matrix element $(ED)_{if}$ (E -- electric vector, D -- dipole moment), and considerable differences are found. It is shown that the main reason for the large contradiction between the existing theory and experiment is the choice of the matrix element in the form $(ED)_{if}$. Results obtained using $(JA)_{if}$ are

Card 1/2

DZHIBUTI, R.I.; MAMASAKHLISOV, V.I.; MACHARADZE, T.S.

Photomuclear reactions with alpha-particle emission and four-particle correlations in light nuclei. IAd. fiz. 1 no.6:976-983 Je '65. (MIRA 18:6)

1. Institut fiziki AN Gruzinskoy SSR.

L 14182-65
ACCESSION NR: AP5038829

and $C^{12}(p,\alpha\gamma)$ reactions; $(\gamma,p\alpha)$ reactions; the large reduced widths of processes involving expulsion of heavy particles; the number of effective degrees of freedom of a nucleus as revealed by its level spacing. Cluster model wavefunctions in a Gaussian barrier potential are derived in the third section. In the remainder of the paper several topics are discussed in somewhat more detail. These topics include the structure of Be^8; the $Be^9(\gamma,n)$ and $Be^9(\gamma,p)$ reactions; the low-lying levels in the mirror nuclei F^{19} and Ne^{19}; the magnetic moments of light nuclei; the expulsion of He^3 and H^3 from Fe^{56} by 100 to 600 MeV protons. Orig.art.has: 44 formulas, 3 figures and 5 tables.

ASSOCIATION: Tbilisskiy gosudarstvennyy universitet (Tbilisi State University)

SUBMITTED: 00 ENCL: 00

SUB CODE: NP NR SOV REF: 020 OTHER: 017

2/2

L 1302-65 EWT(m) DIAAP/SSD/AFWL/SSD(t)

ACCESSION NR: AP4048629 S/0048/64/028/010/1550/1572

AUTHOR: Kamanin, I. [illegible]

TITLE: Nucleon clusters in light nuclei /Report, Fourteenth Annual Conference on Nuclear Spectra, held in Tbilisi 14-22 Feb 1964/

SOURCE: AN SSSR. Izv., Seriya fizicheskaya, v.28, no.10, 1964, 1550-1572

TOPIC TAGS: nuclear physics, nucleon clusters, light nuclei

ABSTRACT: The paper is a review of recent experimental and theoretical research on nucleon clustering in light nuclei. In the introductory section the concept of clustering is defined. It is pointed out that clustering is favored by low density of nuclear matter and can, accordingly, be expected to occur in light nuclei and in the peripheral regions of heavy nuclei. In the second section recent evidence for clustering is reviewed; this includes α-particle yields from 40 to 600 MeV proton bombardment; relative yields of heavy particles and nucleons; angular correlation in (p,2α) reactions; π^- capture with expulsion of fast deuterons or tritons; the structure of the giant photodisintegration resonance; photodisintegration resonance in light nuclei; the $Be^9(\alpha,3n)$ and $C^{12}(\alpha,4\alpha)$ reactions; the $Li^6(p,p\alpha)$, $Li^6(p,p\alpha)$

1/2

MAMASAKHLISOV, V.I.; DZHIBUTI, R.I.

Photodisintegration of Be^9 and C^{12} nuclei at high energies.
Zhur. eksp. i teor. fiz. 41 no.5:1493-1497 N '61. (MIRA 14:12)

1. Tbilisskiy gosudarstvennyy universitet.
(Beryllium--Decay) (Carbon--Decay)
(Photonuclear reactions)

Resonance Scattering of Gamma Quanta on the Li^7 Nucleus

S/056/60/039/003/018/045
B004/B060

of triton, not of the nucleus, is therefore in better agreement with experimental results. There are 2 figures and 5 references: 4 Soviet and 1 US.

ASSOCIATION: Tbilisskiy gosudarstvennyy universitet (Tbilisi State University). Institut fiziki Akademii nauk Gruzinskoy SSR (Institute of Physics of the Academy of Sciences, Gruzinskaya SSR)

SUBMITTED: March 31, 1960

Card 3/3

alpha particles and triton. The following relation is written down for an ellipsoid of revolution equivalent to this rotator:

$3ZR^2\beta/\sqrt{5\pi} = (68/49)\overline{r^2}$ (2). Z = 3, R = radius of the equilibrium sphere, β = deformation parameter of the Li^7 nucleus. Data supplied in a paper by A. S. Davydov and G. F. Filippov (Ref. 3) are made use of to write down equation (3) for the magnetic moment, and from (1) and (3) the following correlation function is obtained by substituting the data found by V. Yu. Gonchar, Ye. V. Inopin, S. P. Tsvtko (Ref. 4):

$I(\theta) \sim \left[1 + 1.22P_2(\cos\theta) + 2.77P_4(\cos\theta)\right]$ (4). θ is the angle between the absorbed and emitted γ-quanta. Fig. 2 shows this function on the assumption of a single-particle- and a collective excitation. The value $1.5 \cdot 10^{-13}$ sec was calculated for the lifetime of the state $1/2^-$ (0.477 Mev) of the Li^7 nucleus, when single-nucleon excitation was assumed, and the value $0.96 \cdot 10^{-13}$ was found when the alpha particle - triton pattern was assumed. The value found experimentally is $1.09 \cdot 10^{-13}$ sec. The assumption of the level $1/2^-$ (0.477 Mev) being caused by spin reversal

S/056/60/039/003/018/045
B004/B060

AUTHORS: Vashakidze, I. Sh., Kopaleyshvili, T. I., Mamasakhlisov, V. I., Chilashvili, G. A.

TITLE: Resonance Scattering of Gamma Quanta on the Li^7 Nucleus

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 3 (9), pp. 666-668

TEXT: The authors studied the resonance scattering of gamma quanta on the Li^7 nucleus with the excitation of levels $1/2^-$ (0.477 Mev) and $5/2^-$ (7.46 Mev) (Fig. 1). The calculation of the $5/2^-$ level by means of a model of the oscillator potential, and with the spin-orbit interaction taken into account, is first discussed along with the conception of this level as the rotation of a rigid rotator consisting of an α-particle and a triton ($Li^7 = \alpha + t$), and the equation obtained in a previous paper (Ref. 2) concerning the quadrupole moment of Li^7 is then written down: $Q_0 = (68/49)\overline{r^2}$ (1), where $\overline{r^2}$ denotes the mean square distance between

Card 1/3

85683

The Alpha - Deuteron Model of the Li^6 Nucleus S/056/60/038/006/025/040/XX
B006/B070

ASSOCIATION: Institut fiziki Akademii nauk Gruzinskoy SSR (Institute of Physics of the Academy of Sciences Gruzinskaya SSR)

SUBMITTED: December 19, 1959

Card 4/4

05683

The Alpha - Deuteron Model of the Li^6 Nucleus S/056/60/038/006/025/043/XX
B006/B070

infinite distance. The fact that these curves have a minimum shows that the nucleon system considered is stable. The minimum in both the cases is found for $\lambda = 0.0316 \cdot 10^{26} cm^{-2}$; the energy minima are at -1.58 Mev (Serber-type) and -1.42 Mev (symmetric forces). Finally, the excited state 0^+ (T=1) of the Li^6 nucleus is studied. Fig. 3 shows the curve $E^*(\lambda) - E^*(0)$ as a function of λ for a mixture of Serber-type and symmetric forces. This curve has also a minimum (0.66 Mev) for the same value of λ as in the ground state; it has also a maximum at $0.0158 \cdot 10^{26} cm^{-2}$. The value of excitation energy is found to be 4.77 Mev, which does not agree well with the experimental value of 3.57 Mev. The origin of this divergence is discussed. D. A. Kveselav and Ye. N. Dekanosidze of the Vychislitel'nyy tsentr AN Gruzinskoy SSR (Computation Center of the AS Gruzinskaya SSR), and R. A. Aleksandryan and F. M. Ter-Mikaelyan of the Vychislitel'nyy tsentr AN Armyanskoy SSR (Computation Center of the AS Armyanskaya SSR) are thanked for the calculations. There are 3 figures and 11 references: 3 Soviet, 3 British, 2 US, 1 French, 1 Italian, and 1 Dutch.

Card 3/4

The Alpha - Deuteron Model of the Li^6 Nucleus

S/056/60/038/006/025/049/XX
B006/B070

wave functions have a Gaussian form. It is further assumed that the six nucleon system of the Li^6 nucleus consists of two coupled subsystems, an alpha particle and a deuteron, which continually exchange nucleons, and that this system has an energy minimum. Parameters are defined which characterize the Li^6 nucleus in the ground and the excited states. The eight possible states of a nucleon are defined by its spin, isospin, and belonging to one of the two subsystems, and have the form (a, b, c) where a, b, c, = 1, 2. These states are numbered from 1 to 8, and these numbers are used to characterize, for example, the wave functions. Thus, for example, the spatial part of the wave function of the Li^6 nucleus is represented by $\psi(1234;56)$, where the first four indices refer to the nucleons of the alpha subsystem and the last two to the d subsystem. Since an analytical determination of the energy is not possible on account of the complicated expressions, a numerical calculation is suggested. Energy curves for the ground state of Li^6 are found and shown in Fig. 1 (Serber-type forces, Curve 1; symmetric forces, Curve 2). The ordinate of the curves is taken to be the difference $E(\infty)-E(0)$, where $E(0)$ is the energy of the system when the alpha particle and the deuteron are separated by an

Card 2/4

85683

S/056/60/038/006/025/049/XX
B006/B070

24.6100

AUTHORS: Kopaleyshvili, T. I., Vashakidze, I. Sh., Mamasakhlisov, V. I., Chilashvili, G. A. 19

TITLE: The Alpha - Deuteron Model of the Li^6 Nucleus

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 38, No. 6, pp. 1758-1764

TEXT: A detailed discussion is given of the possibility of considering the Li^6 nucleus to be made of an alpha particle and a deuteron. The energy of the relative motion of these subsystems of alpha and deuteron is calculated on the basis of one of the assumptions, and it is shown that this energy has a minimum in the region of negative values. Among others, a paper by Biel (Ref. 7) is discussed in the introduction; Biel has studied the binding energies of Be^8 and C^{12} nuclei on the alpha-particle model and obtained a good agreement with the experiment by a proper choice of a mixture of Serber-type and symmetric forces. In following Biel, the present authors assume that both the forces between two nucleons and their

Card 1/4

The Structure of the Be^9 Nucleus

two groups: vibrations along the symmetry axis, with the excess neutron being in the ground state, and vibrations along the symmetry axis, with the excess neutron being in the first excited vibrational state. The groups are characterized by $n_2 = 0$ and $n_1 = 1$ (the quantum number n_1 corresponds to vibrations along the symmetry axis, n_2 to vibrations around the center of mass). It follows that n_2 is not greater than unity. Finally, the results obtained are compared with data on the $_{\Lambda}Be^9$ hyper-nucleus. The

authors thank the collaborators of the Vychislitel'nyy tsentr Akademii nauk Armyanskoy SSR (Computing Center of the Academy of Sciences of the Armyanskaya SSR), as well as F. M. Ter-Mikayelyan and R. A. Aleksandryan for having computed the function tables on a "Yerevan" computer. There are 1 figure, 1 table, and 8 references, 1 of which is Soviet.

ASSOCIATION: Institut fiziki Akademii nauk Gruzinskoy SSR (Physics Institute of the Academy of Sciences of the Gruzinskaya SSR)

SUBMITTED: October 1, 1959

Card 3/3

The Structure of the Be^9 Nucleus

$-(\hbar/2\mu)\Delta_\varrho + V_{n\alpha}(|\vec{\varrho}-\vec{u}/2|) + V_{n\alpha}(|\vec{\varrho}+\vec{u}/2|) + V_{\alpha\alpha}(u) + C_{\alpha\alpha}(u)$; $\vec{u}$ denotes the radius vector of the alpha particles, ϱ is the radius vector of the neutron with respect to the center of mass of the two alpha particles, $V_{n\alpha}$ and $V_{\alpha\alpha}$ are the possible energies of the $n\alpha$- and/or $\alpha\alpha$-interaction, $C_{\alpha\alpha}$ is the possible energy of the Coulomb interaction, $\mu_\alpha = 2M$, $\mu = 8M/9$, M is the nucleon mass. According to Suh $V_{nn} = -V_0 e^{-\beta^2 r^2}$ $\left(\beta^2 = 0.266 \cdot 10^{26}\ cm^{-2}\right)$. The energy levels of the Be^9 nucleus are computed by considering the vibrations along the axis of symmetry and around the center of mass of the two alpha particles. In a table, the excitation energies computed from formula (8) are compared with experimental data (Refs. 7, 3). Agreement is satisfactory. Levels with 9.3, 12.4, 14.1, and 15.5 Mev, which so far have not been found experimentally, are obtained theoretically. Their existence appears plausible. On the other hand, two very close levels 17.27 and 17.47 Mev, were found experimentally, to which only one theoretical (rotational) level with 17.2 Mev corresponds. Either there is really only one or there occurs a level splitting which is not covered by (8). From the results it may be concluded that all Be^9 levels consist of

Card 2/3

S/056/60/038/03/26/03?
B006/B014

24.6510

AUTHORS: Vashakidze, I. Sh., Kapaleyshvili, T. I., Mamasakhlisov, V. I., Chilashvili, G. A.

TITLE: The Structure of the Be^9 Nucleus

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 38, No. 3, pp. 937-941

TEXT: Investigations conducted by other authors seem to indicate that the Be^9 nucleus consists of two alpha particles and one neutron. Suh has proved that the binding energy of the Λparticle in the hypernucleus $_{\Lambda}Be^9$ can be made to agree with experiments only if one assumes that this particle moves in the field of the two alpha particles. Similarly, one may assume for the ordinary Be^9 nucleus that the neutron moves in the field of the two alpha particles. In the article under review, the authors want to find out whether such a system is stable, and how the energy spectrum of the nucleus can be interpreted with the help of this model. The Hamiltonian on which investigations are based reads: $H = -(\hbar^2/2\mu_\alpha)\Delta_u -$

Card 1/3

KOPALEYSHVILI, T.I.; VASHAKIDZE, I.Sh.; MANJASAKHLISOV, V.I.; CHILASHVILI, G.A.

Alpha-deuteron model of the Li^6 nucleus. Trudy Inst. fiz. AN Gruz. ... 7:231-245 '60. (MIRA 14:10)

(Nuclear models)
(Lithium)

MAMASAKHLISOV, V.I.; KOPALE'SHVILI, T.I.

Rotational level of the Li^7 nucleus. Zhur.eksp.i teor.fiz. 37 no.4:1134-1136 O '59. (MIRA 13:5)

1. Institut fiziki Akademii nauk Gruzinskoy SSR.
(Lithium--Isotopes)

Inelastic Scattering of Nucleons on Mg^{24} and Si^{28} Nuclei SOV/56-37-1-21/64

3) The relative angular distribution which is connected with the collective excitation does not depend on the amount and sign of the deformation. Such a dependence, although weak, exists however in the case of one-particle excitation. There are 6 references, 1 of which is Soviet.

ASSOCIATION: Institut fiziki Akademii nauk Gruzinskoy SSR
(Institute of Physics of the Academy of Sciences of the Gruzinskaya SSR)

SUBMITTED: January 17, 1959

Card 3/3

Inelastic Scattering of Nucleons on Mg^{24} and Si^{28} Nuclei

Mg^{24} nucleus, only the transition $1/2 \rightarrow 1/2$ is possible at one-particle excitation. The same transitions are possible for Si^{28} as for Mg^{24}. If the excitation energy of the next level in the Si^{28} nucleus is 1.77 Mev, the values $\delta = 0.1$ and $\delta = 0.3$ are obtained for the deformation parameter δ in the transition $1/2 \rightarrow 1/2$, and $\delta = 0.1$ in the transition $3/2 \rightarrow 3/2$. The angular distribution of the protons non-elastically scattered on the Mg^{24}- and Si^{28} nuclei can also be easily found when a collective level is excited. By comparing the results found for the cases of one-particle excitations and of collective excitations, the following conclusions are derived at: 1) At the same value for the radius of the equilibrium sphere, upon which the angular distribution depends considerably, the position of the maxima in the distribution is different (according to the nature of the excitation of the nucleus). Numerical examples are given. 2) In the investigation method used here, the existence of a second maximum on the experimental curve of angular distribution cannot be explained in anyone of the cases of excitation investigated.

21(7) SOV/56-37-1-21/64

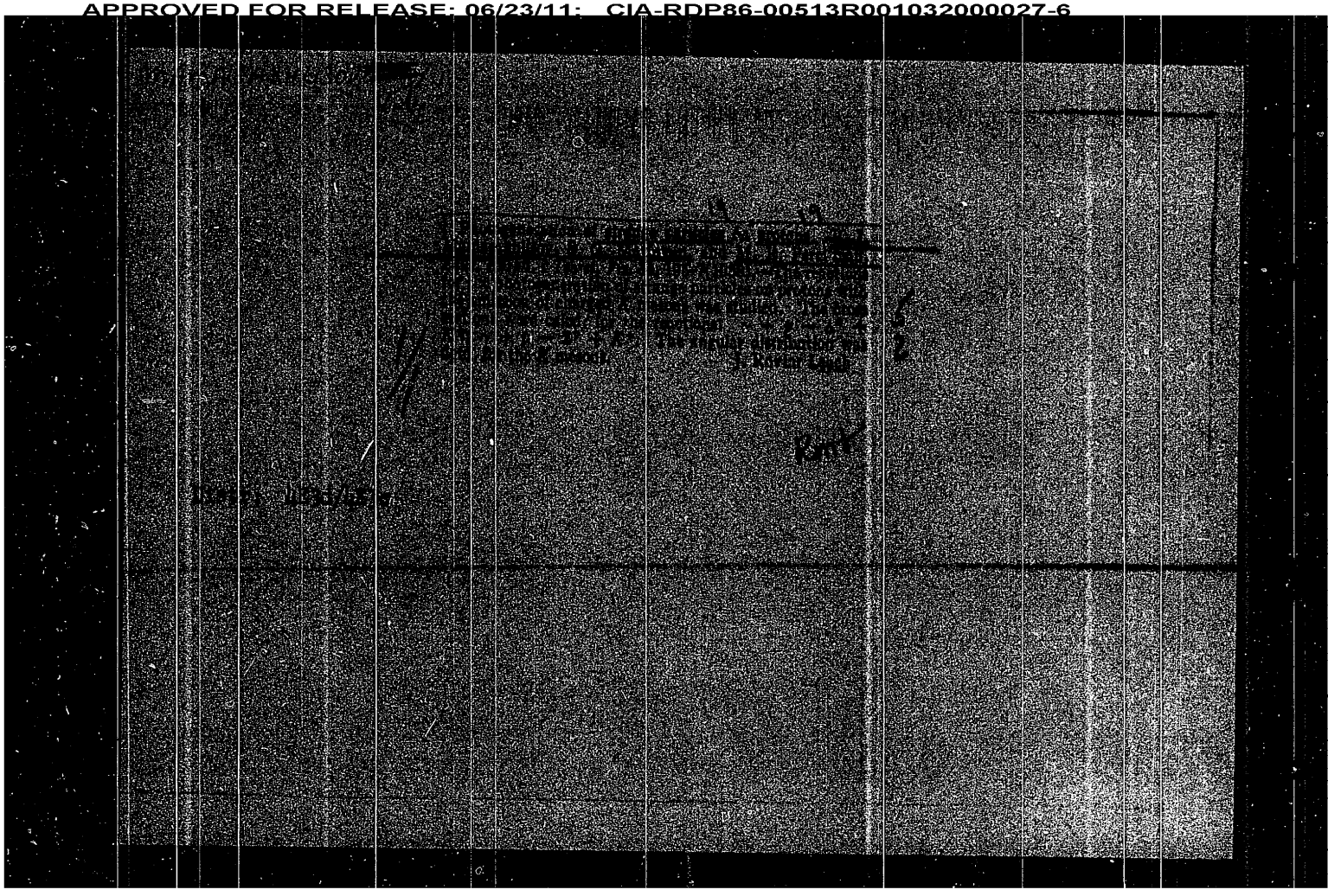
AUTHORS: Mamasakhlisov, V. I., Kopaleyshvili, T. I.

TITLE: Inelastic Scattering of Nucleons on Mg^{24} and Si^{28} Nuclei (Neuprugoye rasseyaniye nuklonov na yadrakh Mg^{24} i Si^{28})

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 1(7), pp 131-136 (USSR)

ABSTRACT: The present paper deals with the theoretical investigation of inelastic scattering of nucleons on Mg^{24}- and Si^{28} nuclei. The one-particle- and the collective excitation are considered. In contrast to T. Sawicki (Ref 3), the authors also consider the Coulomb interaction, and they investigate the dependence of the nature of angular distribution and of the amount of the scattering cross section on the amount and sign of the deformation. In the calculation of one-particle excitation, it is assumed that of the nucleons present beyond a closed shell only one is excited which moves in the field of the deformed nucleus. An expression for the differential cross section of inelastic scattering is derived. These formulas are then applied to the proton scattering on Mg^{24}- and Si^{28} nuclei with excitation of the first level. In a deformed

Card 1/3



APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001032000027-6

On the Inelastic Scattering of Deuterons by the Mg^{24} Nucleus SOV/56-[illegible]

for the interaction potential and the matrix elements of the investigated transition (Born's approximation). Both nuclear interaction and the electric interaction between the deuteron and the nucleus are taken into account. Finally, a formula is derived for the differential inelastic scattering cross section, and the experimental (Ref 4) and theoretical results obtained for $d\sigma/d\Omega$ are compared in a diagram. The theoretical calculated values partly deviate considerably from experimental ones, which is attributed to the manner of approximation used in calculation. There are 1 figure and 4 references, [illegible] of which is Soviet.

ASSOCIATION: Institut fiziki Akademii nauk Gruzinskoy SSSR (Physics Institute of the Academy of Sciences of the Georgian SSR)

SUBMITTED: May 20, 1958

Card 2/2

24(5)

AUTHORS: Kopaleyshvili, T. I., Manasakhlisov, V. I. SOV/56-35-4-32.

TITLE: On the Inelastic Scattering of Deuterons on the Mg^{24} Nucleus (O neuprugom rasseyanii deytronov na yadre Mg^{24})

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol 35, Nr 4, pp 1017 - 1019 (USSR)

ABSTRACT: In their introduction the authors discuss experimental work carried out earlier in connection with this subject. In England (Ref 1) results were published concerning the inelastic scattering of 8.9 MeV deuterons on Mg^{24} with excitation of the levels $2^+, 4^+, 2^+$ with the energies 1.37, 4.12 and 4.23 MeV (angular distribution, scattering probability). The authors themselves already investigated (Ref 2) the scattering of deuterons on Mg^{24}-nuclei with excitation of the 1.37 MeV level; in the present paper the same is done with respect to the excitation of the 4.23 MeV level (2^+). First, the conditions are discussed ($K = 2$, $I = 2$, $n_\beta = 0$, $n_\gamma = 1$) and an ansatz is made

Card 1/2

The Angular Distribution of Inelastically Scattered Deuterons SOV/56-34-5—17/61

There are 2 figures and 7 references.

ASSOCIATION: Institut fiziki Akademii nauk Gruzinskoy SSR (Physics Institute of the AS of the Georgian SSR)

SUBMITTED: November 28, 1957

1. Deuterons--Distribution 2. Deuterons--Scattering
3. Mathematics--Appliactions

Card 3/3

The Angular Distribution of Inelastically Scattered Deuterons SOV/56-34-5-17/61

with respect to the multipoles $V' = \sum V'_e$. After the interaction the nucleus is in the state 2^+ which is the first excited level of even - even nuclei. Then the authors give a (rather long) expression for the matrix element of the investigated process. Formulae are given, moreover, for the wave functions of the deformed nucleus in the excited state and in the ground state and also for the differential cross section of the investigated process.

The authors can compare the theoretical distributions found in this paper with the experimental data for the nuclei Mg^{24} and C^{12}. In the case which is investigated in this paper, the rôle of the electric interaction is as important as the nuclear interaction. A figure shows the angular distribution calculated in this paper. A way of attaining the best possible agreement between theoretical and experimental results is discussed with a few words. The remaining differences between theory and experiment may be caused by the inadequacy of the assumption that the discussed process causes a one-phonon excitation in the nucleus C^{12}.

Card 2/3

AUTHORS: Mamasakhlisov, V. I., Kopaleyshvili, T. I. SOV/56-34-5-17/61

TITLE: The Angular Distribution of Inelastically Scattered Deuterons (Uglovoye raspredeleniye neuprugo rasseyannykh deytronov)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol. 34, Nr 5, pp. 1169-1175 (USSR)

ABSTRACT: This paper discusses the non-elastic scattering of deuterons on the nuclei of Mg^{24} and C^{12} using the generalized nuclear model. The authors assume that by the collision of the deuteron with the nucleus only the collective degrees of freedom of nucleus are excited. The following two cases are possible:
1) The rotational levels and the vibrational levels are excited.
2) The excited nuclei have a phonon character.
The realization of the first or of the second case depends on whether the initial nucleus is deformed or not. First the authors give the Hamiltonian, assuming that the nucleon in the free state interacts with the surface of the nucleus in the same way as in the bound state. The operator V' of the electric interaction of the proton with the nucleon is expanded

Card 1/3

MAMASAKHLISOV, V.I.; MATINYAN, S.G.; PEREL'MAN, M.Ye.

Photoproduction of strange particles by protons [with summary in English]. Zhur. eksp. i teor. fiz. 34 no.1:195-197 Ja '58.
(MIRA 11:5)

1.Institut fiziki Akademii nauk Gruzinskoy SSR.
(Particles, Elementary)
(Nuclear reactions)

KOPALEYSHVILI, T.I.; MAMASAKHLISOV, V.I.

Inelastic scattering of deuterons on the Mg^{24} nuclei [with summary in English]. Zhur. eksp. i teor. fiz. 35 no.4:1017-1019 O '58.
(MIRA 12:1)

1. Institut fiziki AN Gruzinskoy SSR.
(Magnesium--Isotopes) (Deuterons--Scattering)

The Photo-Production of Strange Particles on Protons 56-1-27/56

of the parity of the system ($\Lambda^{\circ} K^{+}$) with regard to the proton. There are 1 figure and 6 references, 3 of which are Slavic.

ASSOCIATION: Institute for Physics AN **Georgian** SSR
(Institut fiziki Akademii nauk Gruzinskoy SSR)

SUBMITTED: July 27, 1957

AVAILABLE: Library of Congress

Card 3/3

cesses of production of K^+ mesons and use the hypothesis of the conservation of parity in the electromagnetic interactions. Therefore the two diagrams given here are the only possible diagrams of the process. The angular distribution of the K^+ mesons is calculated by the usual method and is here written down for the case of the center-of-gravity system. The interaction of the γ quanta with the field of the virtual K^+ mesons furnishes a considerably smaller contribution to the cross section than the direct interaction of a γ quantum with the proton. When the system $(\Lambda^\circ K^+)$ has the same parity as the proton the angular distribution of the K^+ mesons in the center-of-gravity system is shifted toward larger angles. For that of the parity of the system $(\Lambda^\circ K^+)$ which is opposed to the parity of the proton, the opposite result is obtained. Then the production of Σ--hyperons is investigated. In this case the angular distribution in the center-of-gravity system must be isotropic. The total cross section is here written down on the assumption that the square of the mass of the K-meson can be disregarded with respect to the square of the mass of the Σ-hyperon. The comparison of the results obtained here with the experiment will make possible a solution of the problem

MAMASAKHLISOV, V. I.

AUTHORS: Mamasakhlisov, V. I., Matinyan, S. G., Perel'man, M. Ye. 56-1-27/56

TITLE: The Photo-Production of Strange Particles on Protons (Fotoobrazovaniye strannykh chastits na protonakh)

PERIODICAL: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1958, Vol. 34, Nr 1, pp. 195-197 (USSR)

ABSTRACT: The present paper investigates the reactions of photo-production of strange particles on protons with emission of charged K-mesons: $\gamma + p \rightarrow \Lambda^{\circ} + K^{+}$ (1'), $\gamma + p \rightarrow \Sigma^{\circ} + K^{+}$ (1"). The cross sections of these processes are calculated in second perturbation theoretical order. The authors here select the value 1/2 for the spin of the Λ°-hyperon and the value 3/2 for the spin of the Σ°-hyperon. The proton and the Λ°particle shall satisfy the Dirac equation (where the interaction of the electromagnetic field with the magnetic moments of the particles is disregarded) and the Σ-hyperon is described by the equation of Rarita-Schwinger (Rarita-Shvinger) for the particle with spin 3/2. The direct interaction of the γ quantum with the nucleon as well as its interaction with the field of the virtual K mesons are taken into account here. The authors here investigate the pro-

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56-4-21/52

The Spallation of Light Nuclei in a Coulomb's Field

ASSOCIATION State University Tblissi (= Tiflis)
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APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001032000027-6

56-4-21/52

AUTHOR: MAMASAKHLISOV, V.I., CHILASHVILI, G.A.

TITLE: The Spallation of Light Nuclei in a Coulomb's Field (Rasshcheplenlye legkikh yader v kulonovom pole. Russian)

PERIODICAL: Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol 32, Nr 4, pp 806 - 810 (U.S.S.R.)

ABSTRACT: The paper under review investigates the probability of the above spallation. In this context, the masses and the charges of the nuclear parts are denoted by M_1 and M_2, Z_1' and Z_2'. The light nucleus of the mass $M_0 = M_1 + M_2$ and of the charge $Z_1 = Z_1' + Z_1''$ is supposed to penetrate the Coulomb's field of a heavy nucleus of the charge Z. In the general case, the Coulomb's interaction is of the following form - $V = Z_1 Ze^2/r_1 + Z''Z^2e/r^2$. In this context, r_1 and r_2 stand for the distances between the centers of mass of both parts, respectively, of the light nucleus and the center of mass of the heavy nucleus. Let the radius of the light nucleus be much smaller than the distance between the centers of the nuclei under consideration. In the frame of reference in which the light nucleus as a whole rests and in which the heavy nucleus is in motion the electrostatic energy of the light nucleus (which may be considered as perturbation) equals $V = Z_1 Ze^2/[b^2 + (z-vt)^2]^{1/2}$. In this context, $Z_1 = Z'_1 + Z''_2$, v denotes the velocity of the heavy

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MAMASAKHLISOV, V. I. and KOPALEYSHVILI, T. I.

"Angular Distribution of Inelastic Scattered Deuterons,"

Inst. for Physics, Georgian Acad. Sci.

paper submitted at the All-U Conf. on Nuclear Reactions in Medium and Low Energy Physics, Moscow, 19-27 Nov 57.

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001032000027-6

MAMASAKHLISOV, V. I.

"Investigation of the $Be^{9}(d,n)Be^{10}$ Nuclear Reaction," by V. I. Mamasakhlisov, Institute of Physics. Academy of Sciences Georgian SSR, Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 31, No 4 (10), Oct 56, pp 652-656

A formula is derived for the total effective cross section of the reaction between a beryllium nucleus and a deuteron in which the latter is captured by the nucleus and the odd beryllium neutron is expelled. A formula for the angular distribution of the expelled nuclei is also determined.

"Satisfactory" agreement is found between the angular distribution and experimental data, but "there are no experimental data in the literature by which the expression for total effective cross section can be checked."

Sum 1274

MAMASAKHLISOV, V.I.

"Disintegrations of Light Nuclei in Collisions With Heavy Nuclei," by V. I. Mamasakhlisov, Corresponding Member, Academy of Sciences Georgian SSR, and G. A. Chilashvili, Tbilisi State University imeni Stalin, Soobshcheniye Akademii Nauk Gruzinskoy SSR, Vol 17, No 10, Oct 56, pp 873-877

The two-particle model for light nuclei is assumed, according to which Li^6 can be represented as a ($He^4 + H^2$) system and Be^9 as a ($Be^8 + n$) system.

On the basis of this model, the article gives a theoretical calculation of the stripping cross section for collisions between such light nuclei and heavy nuclei.

For Li^6, the expression for stripping cross section yields the value $6.59 \cdot 10^{-26} A^{1/2}$ cm^2 and for Be^9, $10.9 \cdot 10^{-26} A^{1/2}$ cm^2. A. represents the mass number of the heavy nucleus.

An expression for the angular distribution of decay products is also obtained. (U)

SUM. 1360

MAMASAKHLISOV, V. I.

"Disintegration of Light Nuclei in a Coulomb Field," by V. I. Mamasakhlisov, Corresponding Member, Academy of Sciences Georgian SSR, and G. A. Chilashvili, Tbilisi State University imeni Stalin, Soobshcheniye Akademii Nauk Gruzinskoy SSR, Vol 17, No 9, Sep 56, pp 777-784

This work presents formulae for analyzing disintegrations of nuclei in the coulomb field of another nucleus. It considers the general case of nuclei with an uneven neutron in an arbitrary state and with orbital momentum l. Nuclei which fissure into two charged particles in a coulomb field are considered as a build-up of groups of nucleons (α-particles, deuterons, tritons, etc.).

The effective cross section for light nuclei in a coulomb field, at an energy of approximately 100 Mev, is given as $10^{-29}(Z \cdot Z_1)^2$ cm^2. (U)

SUM. 1345

Mamasa Khisev, V.I.

Category : USSR/Nuclear Physics - Nuclear Reactions C-5

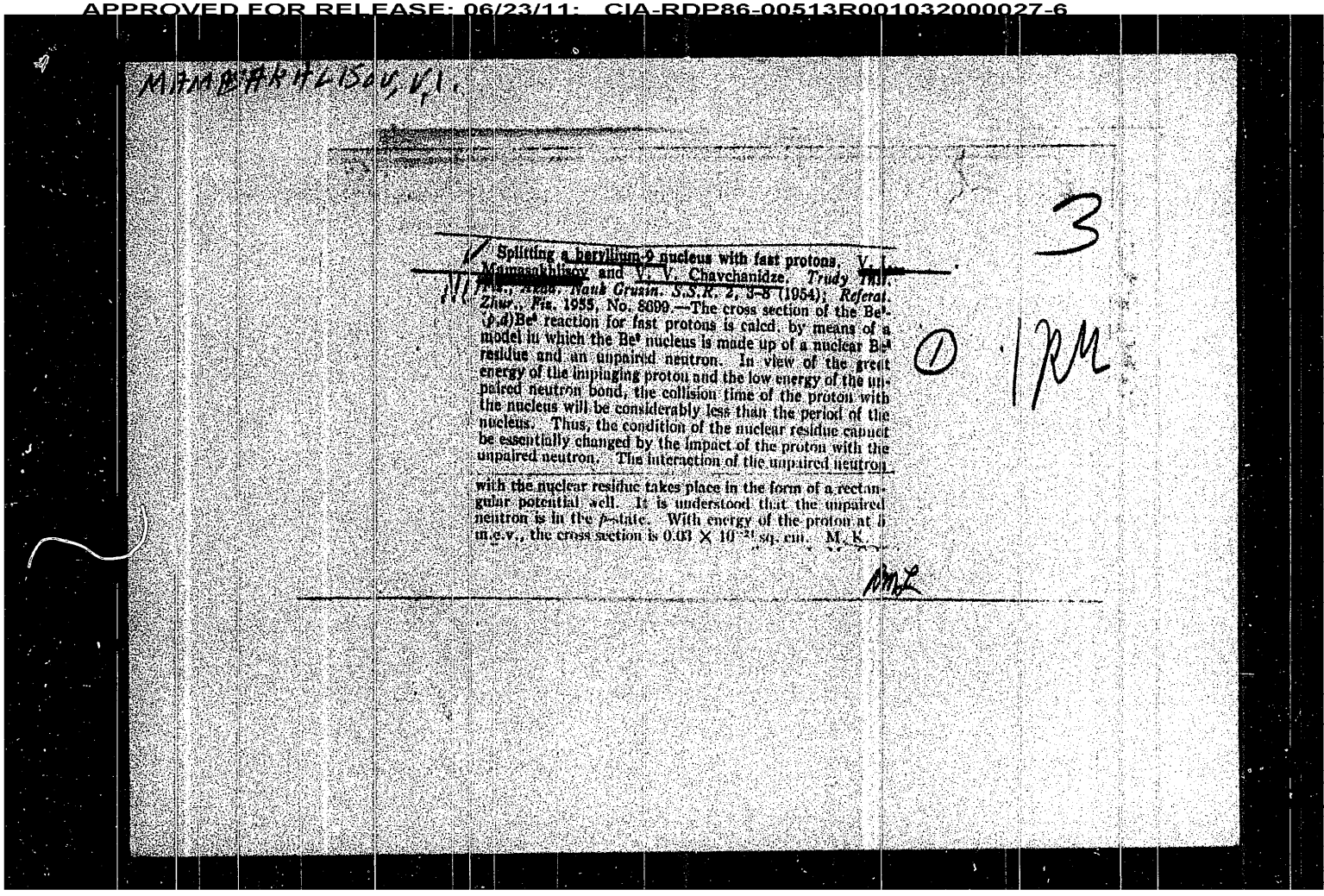
Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6063

Author : [redacted], Kopaleyshvili, T.I.
Inst : Tbilisi University
Title : Investigation of the Nuclear Reaction O^{17} (d,n)F^{18}.

Orig Pub : Coobshch. AN GruzSSR, 1955, 16, No 9, 673-680.

Abstract : The cross section of the reaction O^{17} (d,n) F^{18} is calculated under the assumption that the "breaking up" deuteron enters into the nucleus and the neutron of O^{17} is ejected to the outside. The energy of the deuteron-neutron interaction in O^{17} is chosen in the form $V = g\left(\delta(\vec{r}_1 - \vec{r}) + \delta(\vec{r}_2 - \vec{r})\right)$, where r_1 and r_2 are the radius vectors of the neutron and proton entering into the deuteron, r the radius vector of the neutron of the nucleus, and $g = (4\pi\hbar^2/M)\, a_0^1$ (a_0^1 is the amplitude of the np scattering). The calculation is carried out in the Born approximation. The potential of the interaction between the particles and the nuclear remnant is chosen in the form of a rectangular well. In the calculations, the authors take into

Card : 1/2



Splitting a beryllium-9 nucleus with fast protons. V. I. Mamasakhlisov and V. V. Chavchanidze. *Trudy Tbil. Mat., Fiz.-Mat. Nauk Gruzin. S.S.R.* 2, 3–8 (1954); *Referat. Zhur., Fiz.* 1955, No. 8099.—The cross section of the $Be^9(p,d)Be^8$ reaction for fast protons is calcd. by means of a model in which the Be^9 nucleus is made up of a nuclear Be^8 residue and an unpaired neutron. In view of the great energy of the impinging proton and the low energy of the unpaired neutron bond, the collision time of the proton with the nucleus will be considerably less than the period of the nucleus. Thus, the condition of the nuclear residue cannot be essentially changed by the impact of the proton with the unpaired neutron. The interaction of the unpaired neutron with the nuclear residue takes place in the form of a rectangular potential well. It is understood that the unpaired neutron is in the p-state. With energy of the proton at 5 m.e.v., the cross section is 0.03×10^{-24} sq. cm. M. K.

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U S S R

431. Study of the nuclear reaction $Be^9(n, 2n)Be^8$. V. I. Mamasakhlisov. *Zh. eksper. teor. Fiz.*, 25, [redacted]

The incident neutron is taken as free and the final neutron in Be^9 is assumed to move in a P state in a square well of depth 12 MeV and radius 5×10^{-13} cm. The interaction between these two neutrons is assumed to be of a δ-function character. The two off-coming neutrons are taken to be free. The cross-section obtained is $\sigma \simeq 0.08 \times 10^{-24}(\gamma - 1)^3/\gamma^{[illegible]}$ cm², where $\gamma = E/\varepsilon$, ε is the binding energy of the final neutron in Be^9 and E is the energy of the incident neutron. This is in reasonable agreement with experiment.

G. E. Brown

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001032000027-6

MAMASAKHLISOV, V. I.
USSR/Nuclear Physics - Isotopes

FD-489

Card 1/1 : Pub. 146-6/18

Author : Mamasakhlisov, V. I.

Title : Some peculiarities in the distribution of isotopes of atomic nuclei

Periodical : Zhur. eksp. i teor. fiz., 24, 190-196, Feb 1953

Abstract : Taking under consideration the possibility of formation inside the nucleus of separate groups, for instance alpha-groups, the author explains some peculiarities characterizing the distribution of nuclear isotopes. Offers a distribution scheme of neutrons and protons according to levels in agreement with data on distribution of known stable nuclear isotopes. 4 references, 6 foreign.

Institution : Institute of Physics, Acad. Sci. Georgian SSR

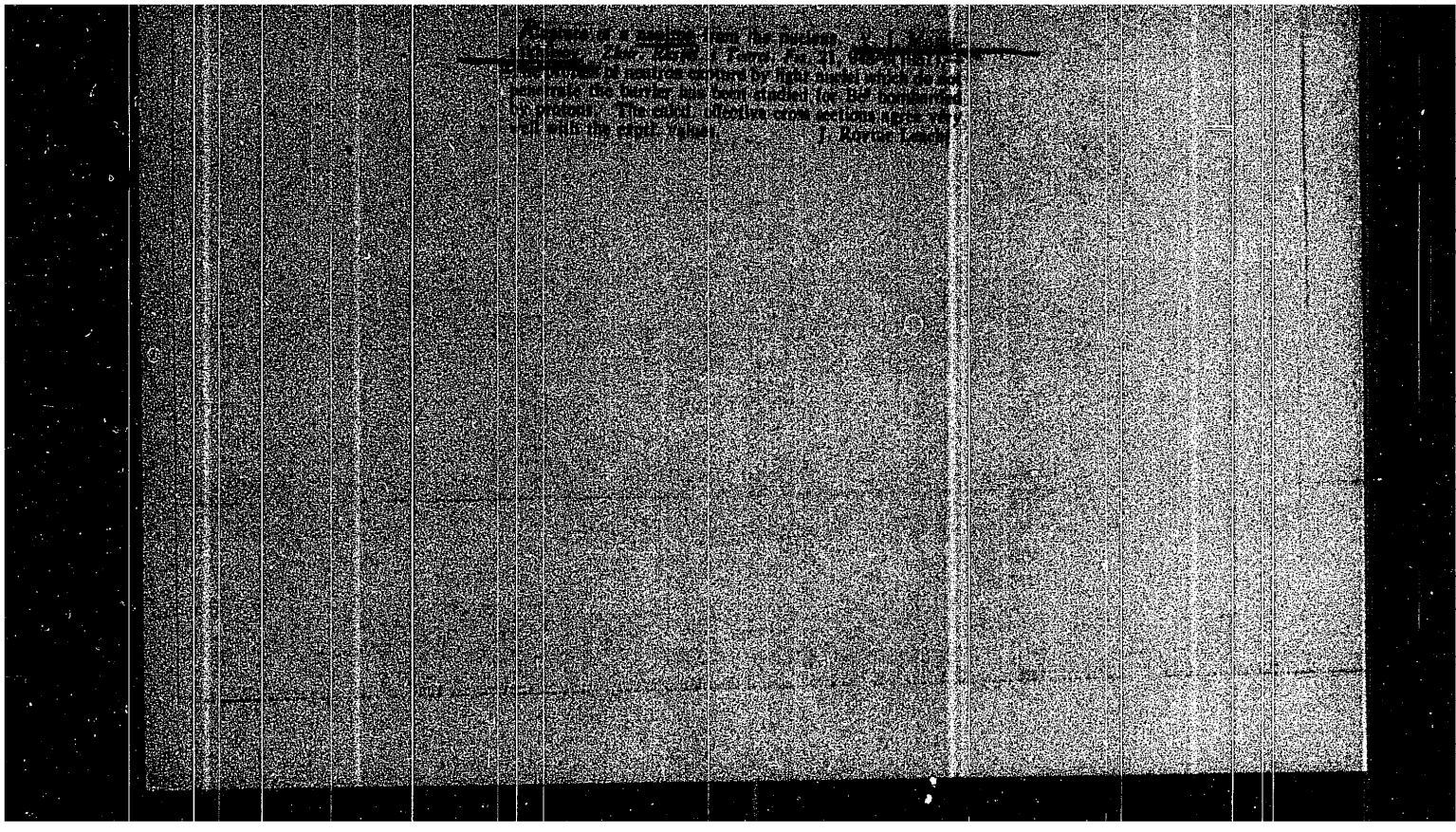
Submitted : June 30, 1952

MAMASAKHLISOV, V. I.

"Capture of Neutron From the Nucleus,"
Tr. In-ta fiziki AN Gruz, SSR, No 1, pp 3-8, 1953

A reaction in which a proton passing near a nucleus captures a neutron from the nucleus is analyzed. The method of L. D. Landau (Sow. Phys. 1, 88, 1932) is used for computing the probability W_1 of neutron capture. This number should be multiplied by W_2, probability of the neutron being within the field of action of the proton. Finally the approxamative value of the cross section is found to be $\sigma \approx (\pi\hbar^2/2ME)W_1W_2$. (RZhFiz, No 4, 1955)

SO: Sum, No 606, 5 Aug 55



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169T105

MAMASAKHLISOV, V. I.

Mamasakhlisov, V. I. " The internal conversion upon the membrane conditioned by the magnetic radiation of the nucleus," Soobshch. Akad. nauk Gruz. SSR, 1948, No. 8, p. 473-79

SO: U-4934, 29 Oct 53, (Letopis 'Zhurnal 'nykh Statey, No. 16, 1949)

Internal conversion in the *M* shell, due to the electric radiation of the nucleus. V. Mamasakhlisov and V. Gurgenidze (Stalin State Univ., Tbilisi). *J. Exptl. Theoret. Phys.* (U.S.S.R.) 17, 673-80(1947)(in Russian).—The matrix elements H_{l0}^{m} of the energy of interaction of the electron with the radiation are calcd. for various l and m, giving the no. N_e of electrons expelled from the M shell by $N_e = (2Z'^2/\pi h^2)\Sigma|H_{l0}^{m}|^2$, the sum extending from $l = 0$, $m = -l$ to $l = 2$, $m = l$; the no. of quanta leaving the nucleus being given by $N_q = (a_l^M)^2/\pi^2 hk$, the coeff. of internal conversion $a_l^M = \beta/(1 + \beta)$, where $\beta = N_e/N_q$. With an effective nuclear charge $Z' = 27$, one finds, for γ-quantum energies E of 0.01, 0.03, and 0.05 μc^2 units, the following values of β: ($l = 1$) 235.5, 4 and 0.165; ($l = 2$) 3920, 66.6 and 1.04; ($l = 3$) 3.2 × 10^4, 982.5 and 7.8, i.e., β increases with decreasing E and with increasing order of the multipole, as in conversion in the K and L shells. Data of Zavelevich (*C.A.* 36, 3728^e) permit comparison of the a_l in the L and in the M shells: for l = 1, 2, and 3, a_l^L = 0.51, 0.97, and 0.99, a_l^M = 0.14, 0.51, and 0.88. N. Thon

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

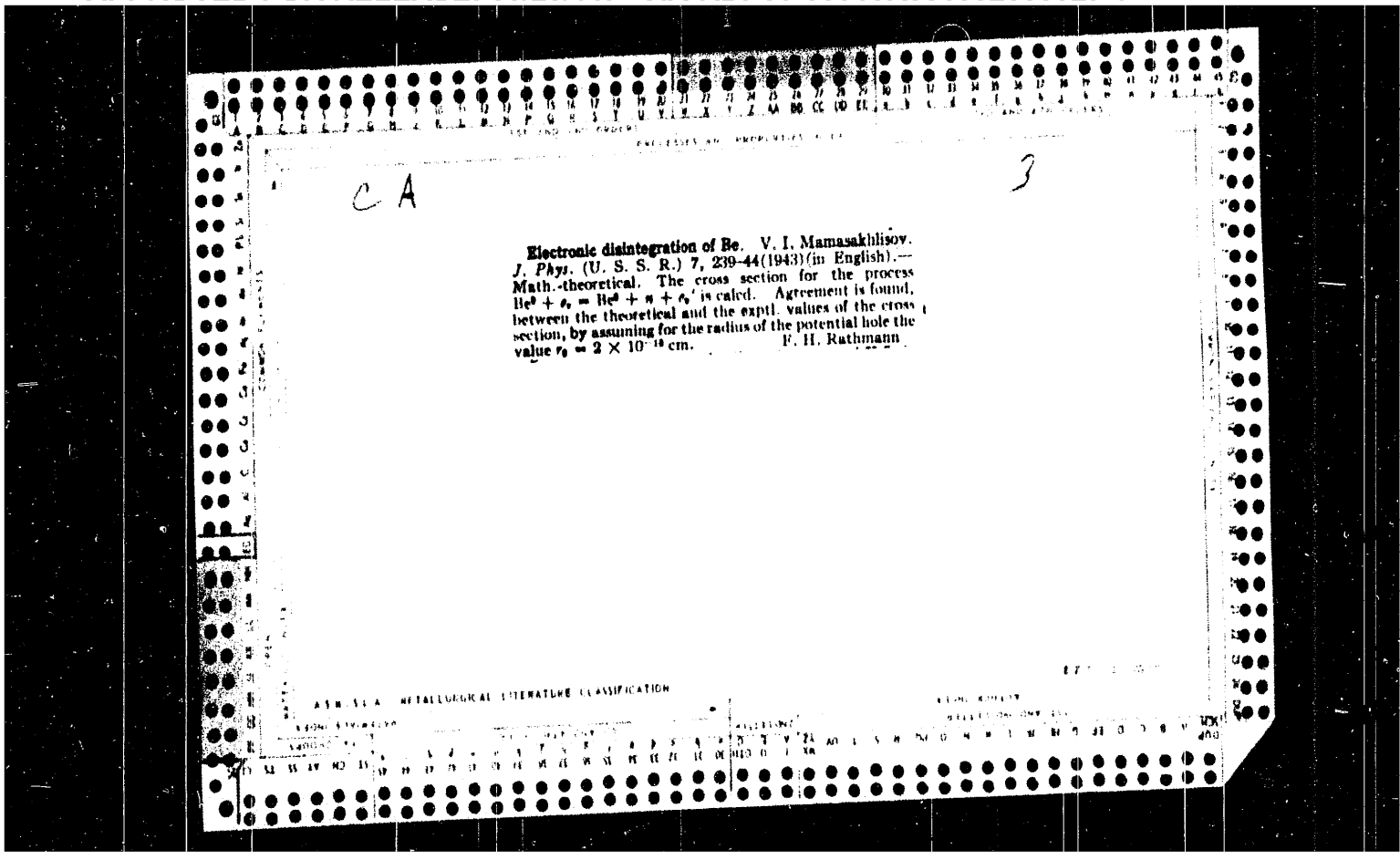
MAMASAKHLISOV, V.I.

Neutron scattering by Be_8 nuclei. Trudy Inst.geofiz.AN Gruz.SSR 10:23-30 '47. (MLRA 9:8)

(Neutrons--Scattering)
(Beryllium--Isotopes)

MAMASAKHLISOV, V.I.

Disintegration of beryllium nucleus by gamma rays. Trudy Inst. geofiz.AN Gruz.SSR 10:1-22 '47. (MLRA 9:8)
(Gamma rays) (Nuclear fission) (Beryllium)



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Electronic disintegration of Be. V. I. Mamasakhlisov. *J. Phys.* (U. S. S. R.) 7, 239-44(1943)(in English).—Math.-theoretical. The cross section for the process $Be^9 + e_0 = Be^8 + n + e_0'$ is calcd. Agreement is found, between the theoretical and the exptl. values of the cross section, by assuming for the radius of the potential hole the value $r_0 = 2 \times 10^{-13}$ cm. F. H. Rathmann

A.S.M.-S.I.A. METALLURGICAL LITERATURE CLASSIFICATION

Magnetic scattering of light on the electron. V. I. Mamasakhlisov. *Bull. Acad. Sci. Georgian S.S.R.* **4**, 641-50(1943)(in Georgian and Russian). The complete expression for the effective cross section for scattering, derived by M. [illegible] *Akad. Nauk Gruzin. S.S.R.* **2**, 59 (1941)) involves a corrective term to Thomson's formula, detd. by the magnetic moment of the electron. Theoretical calcn. gives for the additive term $\sigma_m = (59/144)\pi(e^2/mc^2)(h\omega/mc^2)^2$ which represents a small correction on account of $h\omega \ll mc^2$ (ω = frequency of the impinging quantum). The purely magnetic scattering intensity is max. in the direction perpendicular to that of the incident quantum, in contrast to the main effect. N. T.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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а) На степень доктора наук

732. Балабуев Анатолий Георгиевич. Генезис климата Закавказья. Защ. 1940, 26.12.

733. Калабухов Николай Петрович. Вторичные явления в фотопроводящих кристаллах щелочно-галоидных солей и роль кристаллических дефектов в этих явлениях. 1952. [1], 121 с., илл. (Инст. физики АН Груз. ССР). Защ. 1952, 23.10.

734. Литвинов Всеволод Федорович. Новое состояние нижних слоев атмосферы по наблюдению в г. Алма Ата и его горных окрестностях. Защ. 1939, 20.6.

735. Мамасахлисов Ваган Иванович. Расщепляемые ядра бериллия т лучами и быстрыми электронами. 1943. 119 с. Защ. 1943, 20.11.

736. Мирцхулава Иона Андреевич. Теория концентрированных растворов сильных электролитов. 1949. 1.96, 3 с. Защ. 1950, 4.2.

737. Нодия Михаил Зосимович. Магнитное поле Кавказа. 1937. 109, 74. 9 с., 8 карт. (Тр. Тбил. геофиз. инст. 1939, 67 с.) Защ. 1937, 4.5.

738. Хуцишвили Гиви Раждович. Релаксация и ориентация ядер. 1955. 159 с., с рис. Защ. 1955, 29.10

Dissertation for degree of

Doctor Physico-Mathematical Sciences

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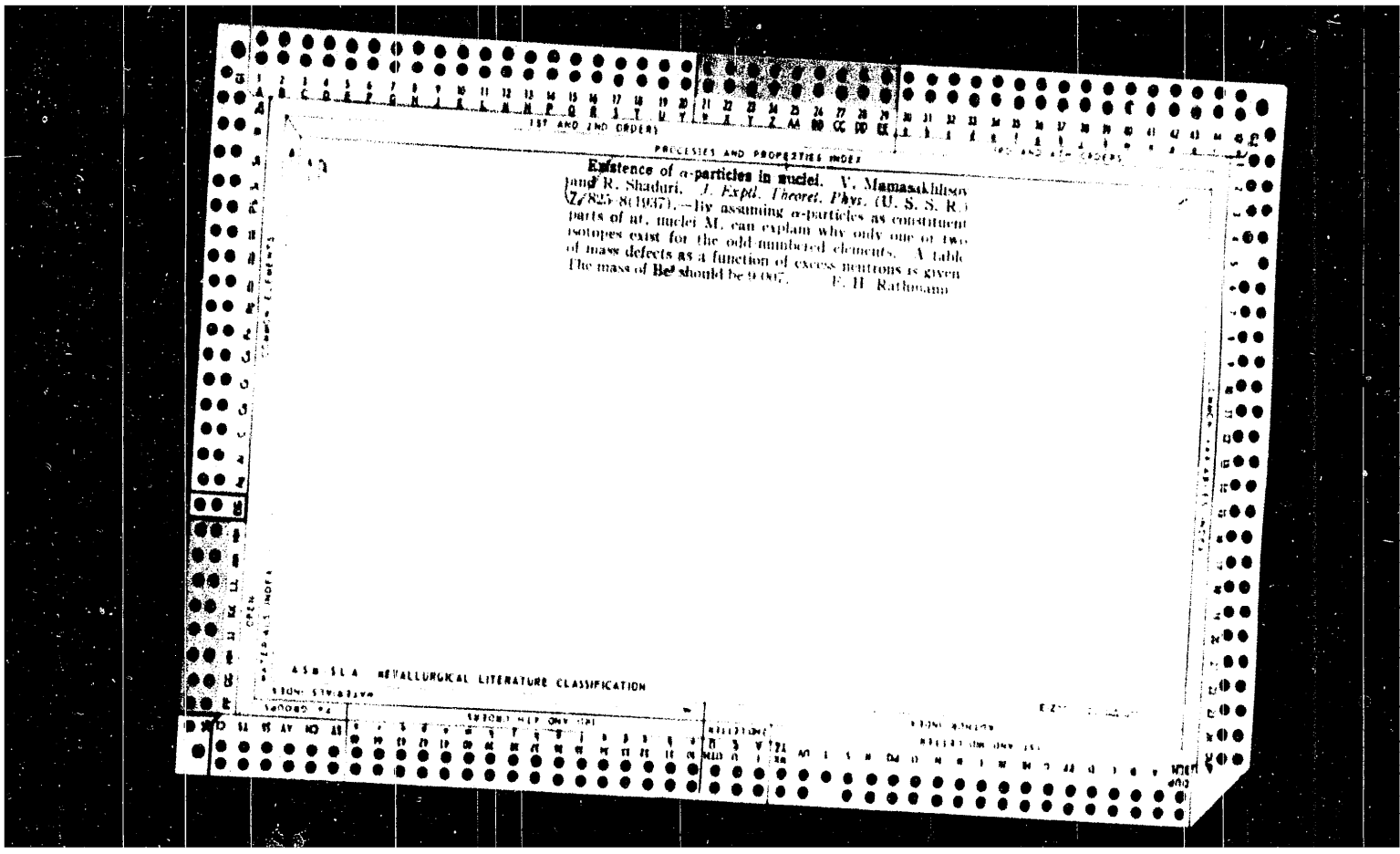

PROCESSES AND PROPERTIES INDEX

Existence of α-particles in nuclei. V. Mamasakhlisov and R. Shaduri. *J. Exptl. Theoret. Phys.* (U. S. S. R.) 7, 825–8 (1937).—By assuming α-particles as constituent parts of at. nuclei M. can explain why only one or two isotopes exist for the odd-numbered elements. A table of mass defects as a function of excess neutrons is given. The mass of Be^8 should be 9.007. F. H. Rathmann

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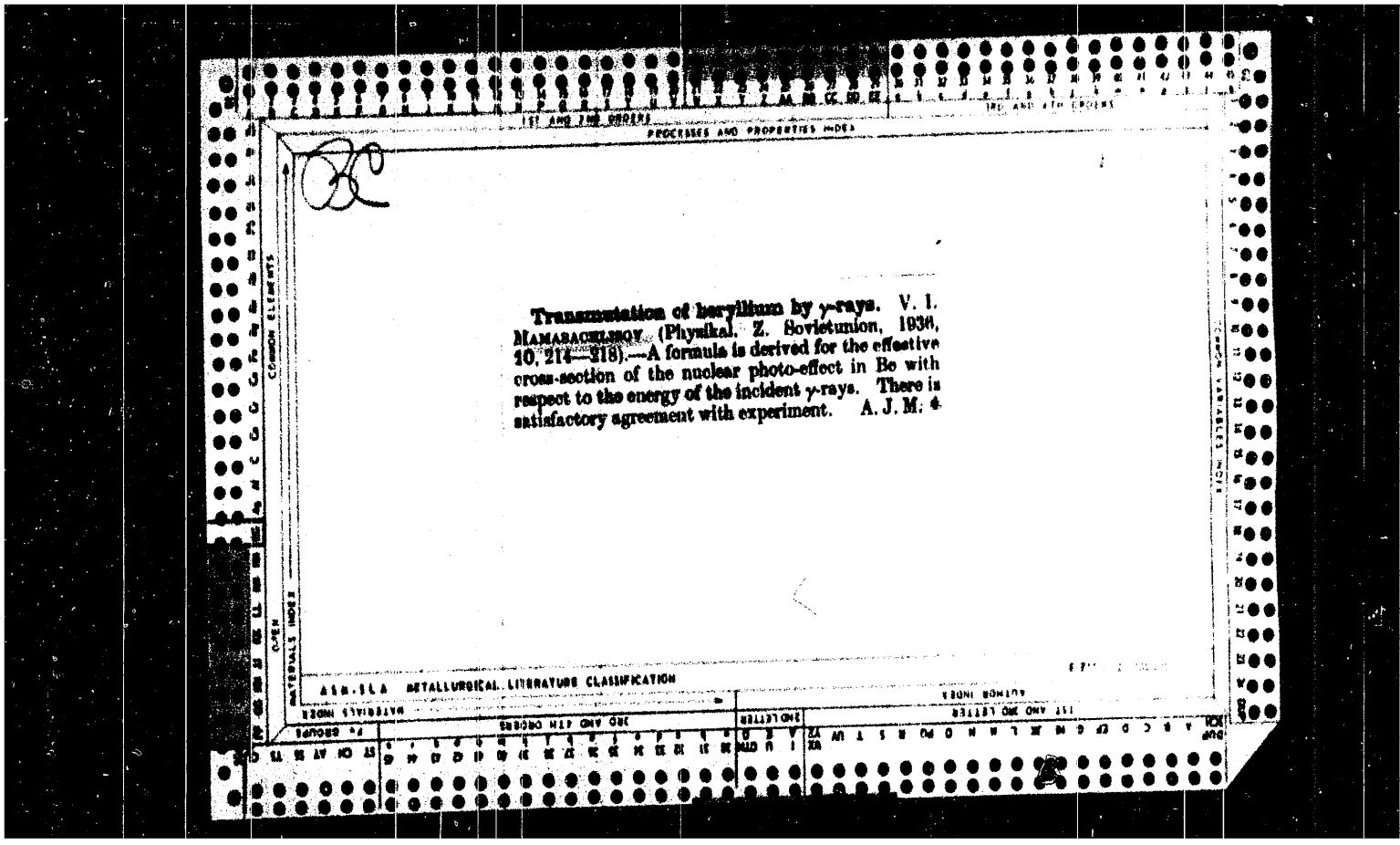

Transmutation of beryllium by γ-rays. V. I. MAMABACHELSHVY. (Physikal. Z. Sovietunion, 1936, 10, 214—218).—A formula is derived for the effective cross-section of the nuclear photo-effect in Be with respect to the energy of the incident γ-rays. There is satisfactory agreement with experiment. A. J. M.